

REALIZING RENTAL ENERGY EFFICIENCY

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About Sean Walsh



- Receiving a Masters in Educational Technology May 2014



- Certificate of competence in sustainable energy 2009



- B.A. in social psychology 2007

- Interest and passion for sustainability and education
- Knowledge of behavioral change
- Familiarity of Hawaii and the obstacles it faces for a sustainable future



Why Energy Efficiency?

- Economic incentives



- Environmental impact

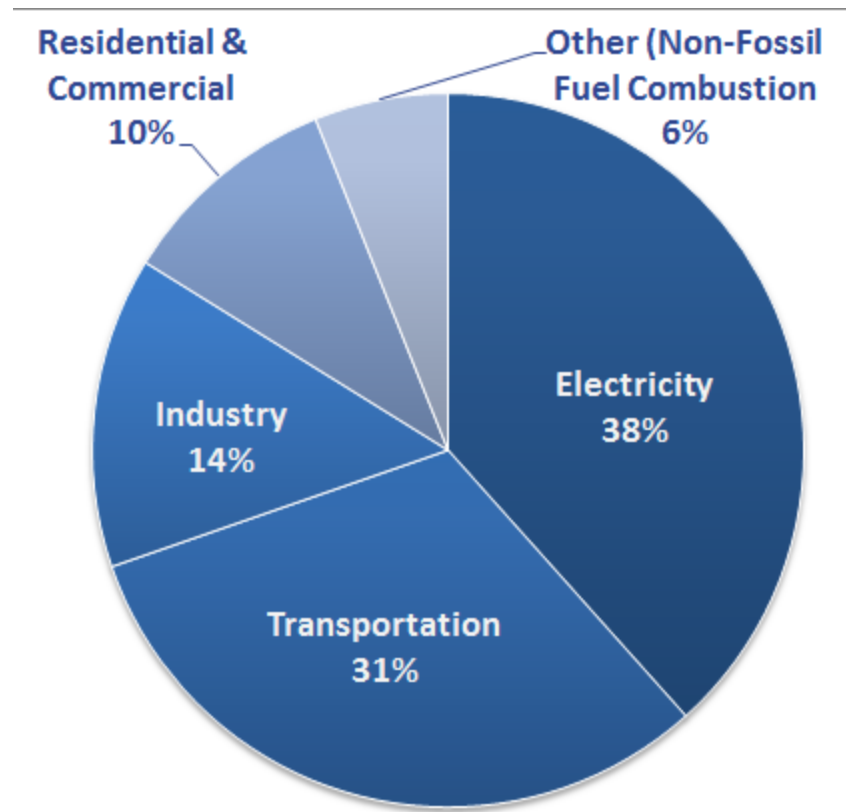
Participant poll 1

- How many of you feel that our fossil fuel consumption has a negative impact on our environment?



Impact of fossil fuel use

- Collection of fossil fuels is costly and harms the environment
- Represents a finite resource
- Releases harmful CO₂ into the atmosphere



U.S. Carbon Dioxide Emissions, By Source

Participant poll 2

- How many of you here pay your own electric bill?

Mau Electric Company
PO Box 395
Kahului, HI 96733-6898

Account Number:
202000797847
Invoice Number:
600002030

Service Address Page 1 of 2
1234 MAUI ST
Contract:
303038912

1 ACCOUNT SUMMARY
(See Bill Detail section for more information)
Service Period 03/06/12 - 04/05/12
Previous Balance \$197.49
Payments \$197.49
OUTSTANDING BALANCE 2 \$0.00
Current Charges \$225.67
Adjustments \$0.00
Current Charges 3 \$225.67
TOTAL AMOUNT DUE 04/06/2012 4 \$225.67

4 MESSAGES
Celebrate Earth Day and plant a native tree. Trees absorb CO2 which can help in the fight against global warming.

5 BILL PERIOD
METER MAI000000001
RESIDENTIAL SERVICE
CURRENT READING 19,328.00
PREVIOUS READING 18,628.00
DIFFERENCE 700.00
FROM 03/06/12 TO 04/05/12 IN DAYS 30
MULTIPLIER 1
USAGE 830.00

6 USAGE PROFILE
DATE AMOUNT DAYS KWH/DAY S/DAY
03/06/12 600 \$225.67 29 20.34 7.18
03/07/12 629 \$167.69 30 17.60 6.58
03/08/12 617 \$168.64 30 18.56 6.15
03/09/12 690 \$257.21 31 22.28 8.30
03/10/12 676 \$219.34 30 18.30 7.27
03/11/12 661 \$217.01 30 18.50 7.43
03/12/12 655 \$250.53 33 20.15 7.59
03/13/12 675 \$252.22 29 18.65 7.58
03/14/12 617 \$187.51 30 16.90 6.59
03/15/12 618 \$232.56 32 18.14 7.58
03/16/12 637 \$227.88 30 21.23 7.58
04/05/12 589 \$258.08 29 22.34 7.58

WHEN PAYING IN PERSON, PLEASE PRESENT BOTH PORTIONS
PLEASE DETACH AND RETURN THIS PORTION WITH:

12 **Mau Electric Company**
PO Box 395
Kahului, HI 96733-6898
Telephone: (808) 857-0777

JOHN DOE
1234 MAUI ST
KAHULUI, HI 96732

14 **John Doe**
123 Main St
Anywhere US 10111

PAY TO THE ORDER OF The Sandwich Shop

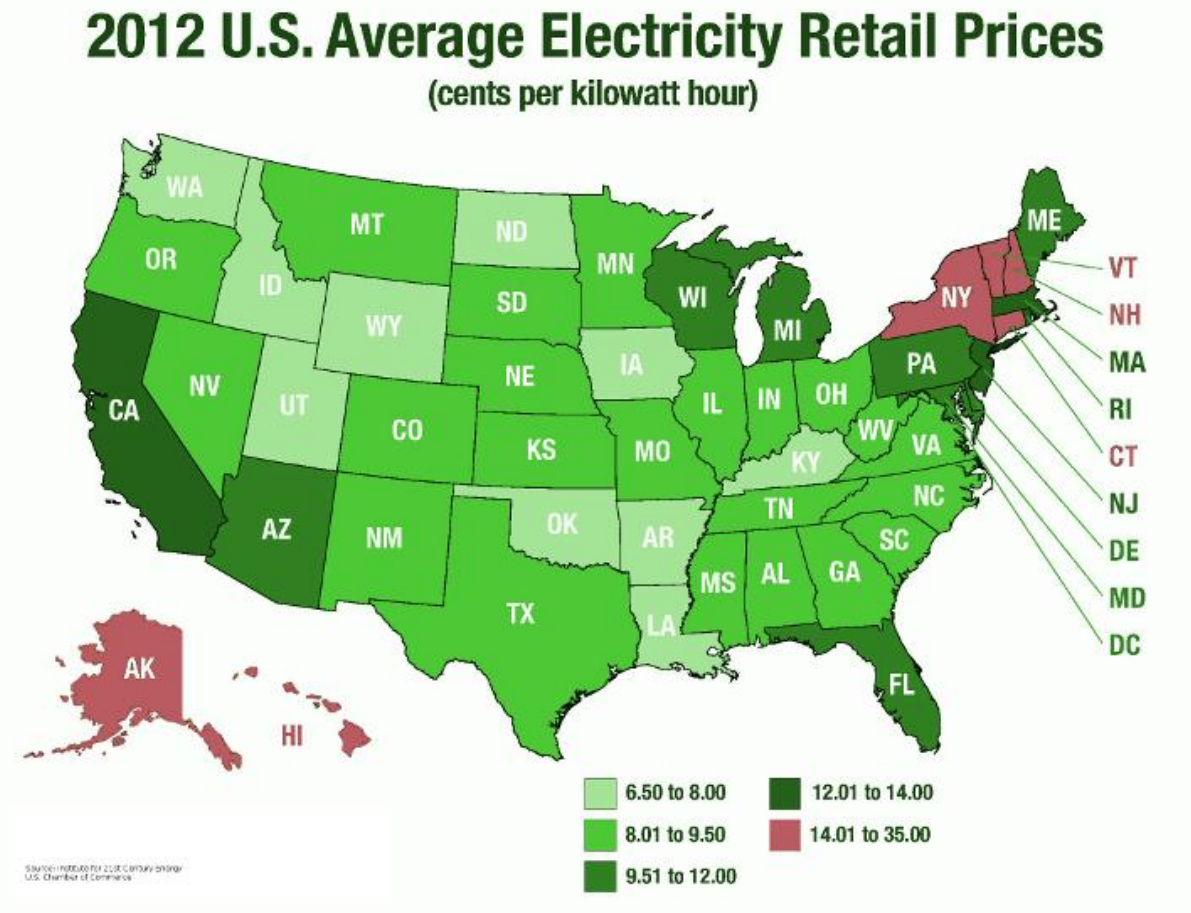
Eight and 15/100 DOLLARS

John Doe

MEMO Lunch with friends

15 **Mau Electric Company**
PO Box 395
Kahului, HI 96733-6898

16 **123456789 1:**



Background research

- Low-income, multi-family, rental households use more electricity than others (Pivo, 2012).
- May be a result of minimal responsibility for the electric bill (La Jeunesse, 2013).
- Efficiency upgrades are more likely when financial and environmental benefits are recognized (Alberini, Banfi, & Ramseier, 2013).
- Reduction in electric use is as simple as altering behavior (Singh Solanki, Sarma Mallela, & Chengke, 2013).
- Lighting retrofits can increase efficiency and perceived satisfaction (Kuhn, Hohansson, Laike, & Goven, 2013).

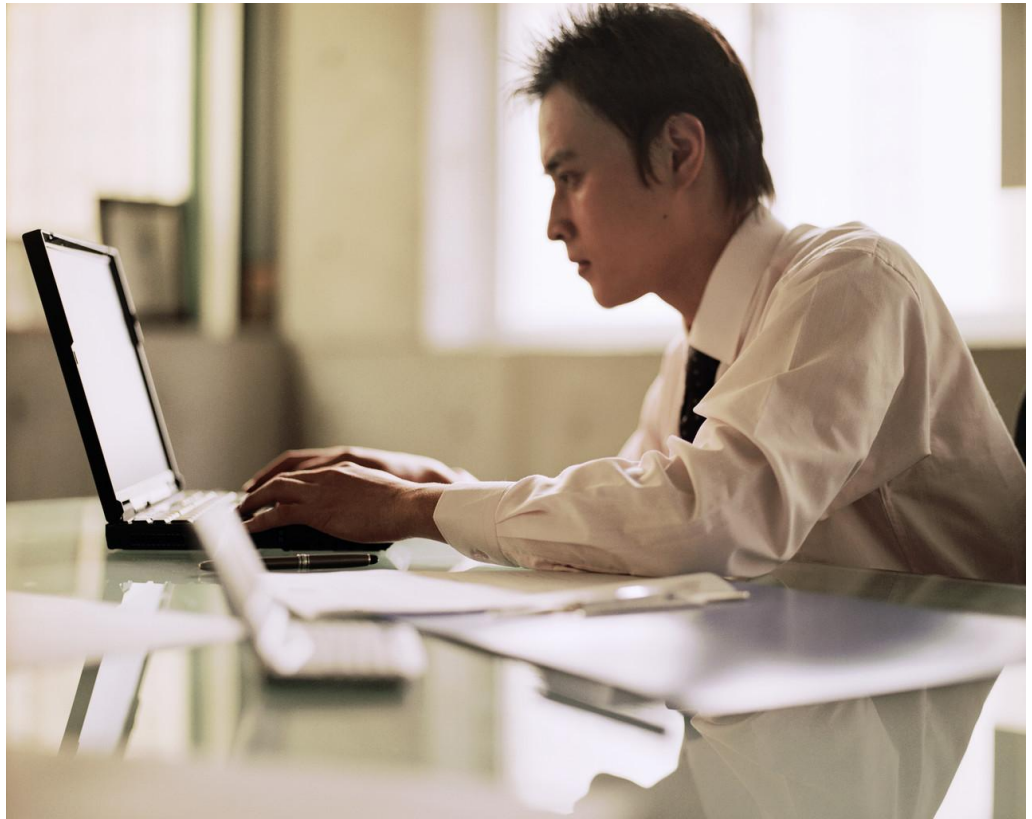
Target audience

- ❑ Renters
- ❑ Ages 18 and older
- ❑ Living in Hawaii



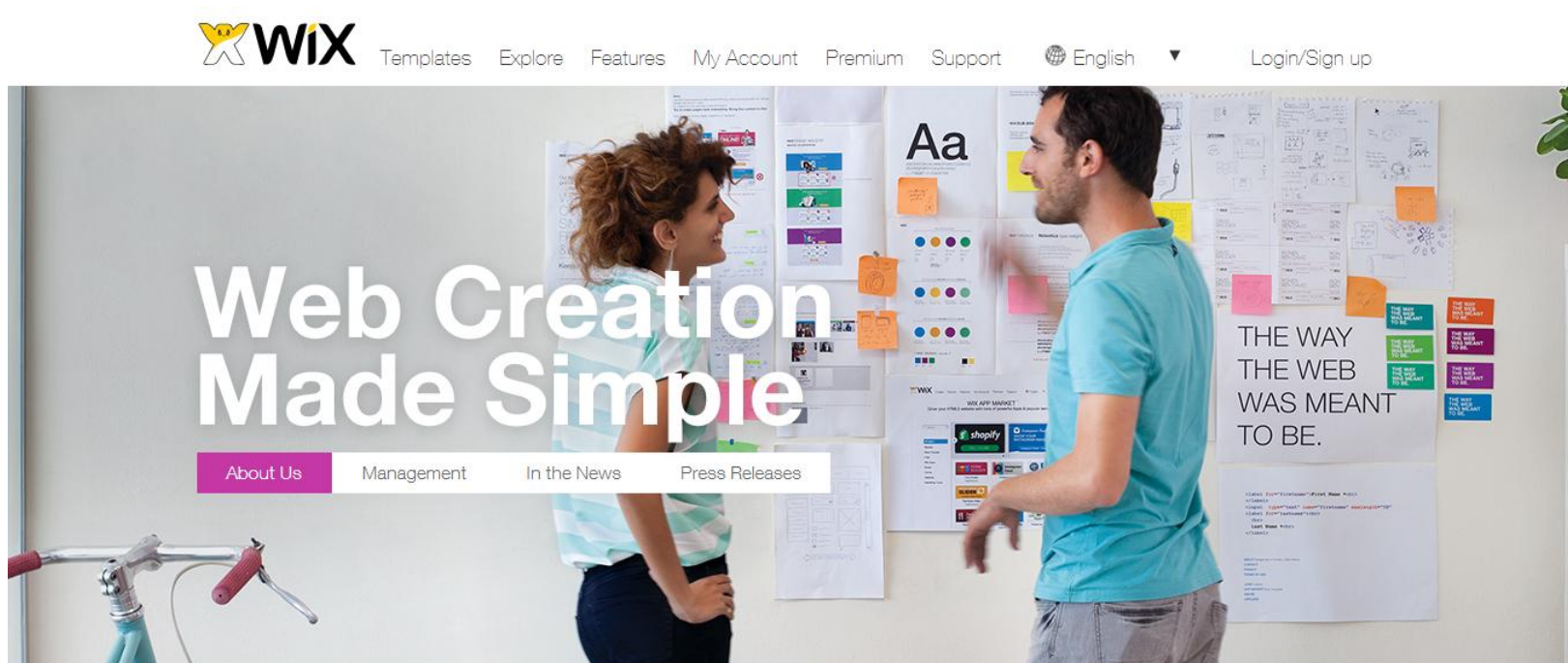
Benefits of asynchronous education

- ❑ Optimal flexibility
- ❑ On your own time
- ❑ At your own pace
- ❑ From any location with internet



The website: Wix

- Ease of navigation
- Familiarity with web interface
- Flexibility in design and accepted content



Chunking the site



□ Lighting



□ Water Heating

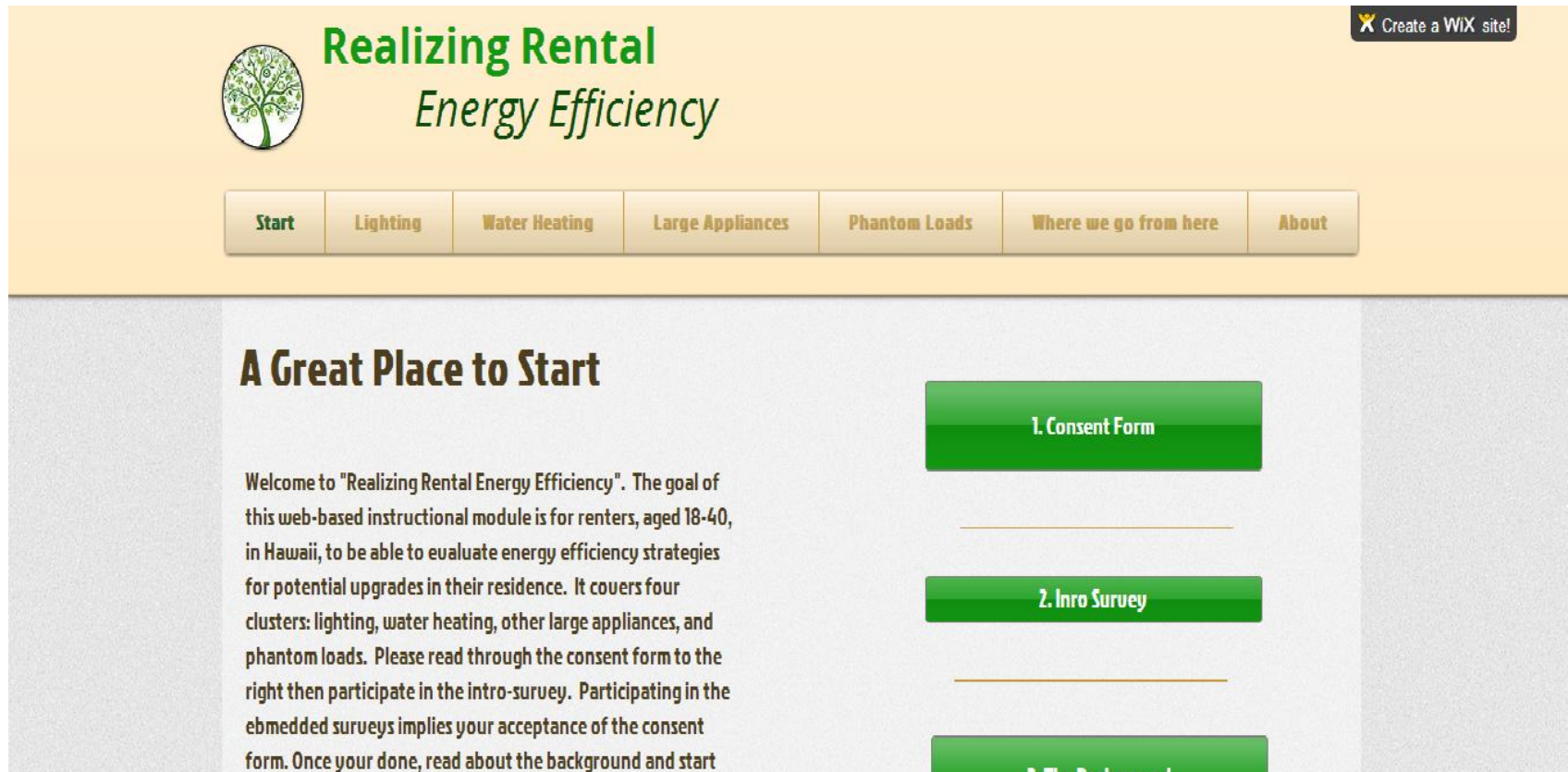


□ Large appliances



□ Phantom Loads




The site: Home page




The site: Sample Content

Create a Wix site!

Comparisons between light-bulb cost of use

	60W Traditional Incandescent	15W CFL	12W LED
			
Electricity Saved (%)	0	~75%	~80%
Annual Electricity Cost*	\$ 31.78	\$ 7.95	\$ 6.36
Bulb Life	~ 1000 hours	~ 10,000 hours	~25,000 hours

*Based on 4 hrs/day usage at Hawaii's average rate in September 2013 of \$0.3628. Prices shown in US dollars per bulb.


Home

Lighting navigation page

Poll 3

- How many of you have been on a website with a vast amount of information, but lost interest before reading through all of it?

1000's of images of stoneware and bottles over the last few months and more are being added every day. Check out the galleries and keep checking them out. Want to see the most AMAZING antique bottle, stoneware and advertising gallery ANYWHERE? Check out the Spinners at <http://www.wisantique.com/> and while you are there consider joining the most amazing antique bottle, antique stoneware and antique advertising club anywhere.

I spent so much energy working to save the Milwaukee antique bottle and advertising club over the last couple of years it pretty much took all of spare bottle time. I gave up and joined Jon Steiner and dozens of other collectors in an amazing new club. It is the Milwaukee Antique & Advertising Club. It is all of the fun, interest and adventure without the negativity. If you love the objects of Wisconsin's past and crave the information that makes them important I highly recommend this club. If you simply want to be part of an amazing positive community of collectors you will love this club. If you join I guarantee you will be glad you did.

01/06/2013 Nate continues to add Wisconsin Antique bottle images. I am adding them regularly too. Even a new Hall Of Famer. I look forward to seeing long time collectors and meeting new ones. Steven

12/19/2012 An Antique Wisconsin Oakton Mineral Spring Water Jug, A nicely decorated Maxfield butter churn and a Hermann cobalt flowered crock just turned up. These very nice people I recently met went to buy an oil painting. As they walked around the home of the owner they realized there was all sort of old things. Knowing the guy was moving out of the house and had no interest in the antique paintings they asked what he was doing with the stone ware. He said everything is for sale. The asking price... Wait for it wait for it... \$5 apiece. As usual... I paid more, A LOT more. All three will be in the galleries soon. New images are going up all the time. Nate continues to plug away and I am getting them in. There are lots of good things happening in the collecting world including the Milwaukee Antique Bottle Club taking a proactive role in promoting antique bottle collecting for 2013.

12/14/2012 It is actually hard to believe some of the great antique bottles and stoneware that show up. Look at this pontiled mint Dr. Ruppert's Aromatic Forest Bitters from Madison. Found in an antique shop for \$20 with an 18% discount offered. It's



Learner engagement

- Simplistic navigation
- Clear and straightforward content
- Strategic use of multimedia including images and 4 videos
- 4 outside learner activities
- Outside resources

Refrigerator Savings Calculator	
Current fridge	<1976 ▾ 22 cu.ft. ▾
New fridge	2008-2010 Energy Star ▾ 22 cu.ft. ▾
New fridge cost	\$ 720
Salvage value of old fridge	\$ 75
Efficiency rebate ?	\$
Electricity rate	15¢ ▾
Savings per year	\$257
Payback time	2.5 years
<p>Your results will vary since energy use varies by actual model. Results assume ice maker is OFF. If it's on, then results could be DOUBLE. See how this was calculated and how to misquote this website</p>	
<div>KitchenAid® Refrigerators kitchenaid.com/Refrigerators There's So Much More to Make with KitchenAid® Refrigerators. Shop Now</div>	

The Intro survey

- Hosted through Google Forms
- Acceptance of the consent form
- Choice of a unique alias
- 7 demographic questions
- 3 attitudinal questions
- 4 behavioral self assessment questions

The screenshot shows a Google Form titled "RREE Introsurvey". The form is titled "Introductory Survey" and is for "Realizing Rental Energy Efficiency". It includes a consent form acceptance section with a dropdown menu. Below this is a section for choosing a unique alias, with a text input field and a note explaining that the alias will be used to link the survey with the post-survey. The form also includes demographic questions for "Gender" (Male/Female) and "Age", and a question about the highest completed educational level (High School/AA). A "Send form" button is visible in the top right corner.

RREE Introsurvey ☆

File Edit View Insert Responses (30) Tools Help

Theme: Header (Blue) View responses Not accepting responses View live form

Page 1 of 1

Introductory Survey

for Realizing Rental Energy Efficiency

I have read and accept the terms of the posted consent form.*

Please choose an alias that will be used link this intro-survey with your post-survey.*
This entry will keep your identity anonymous but allows the linking of your responses. This may also be a random number the you can remember.

Gender*

☐ Male

☐ Female

Age*

What is your highest completed educational level?*

☐ High School

☐ AA

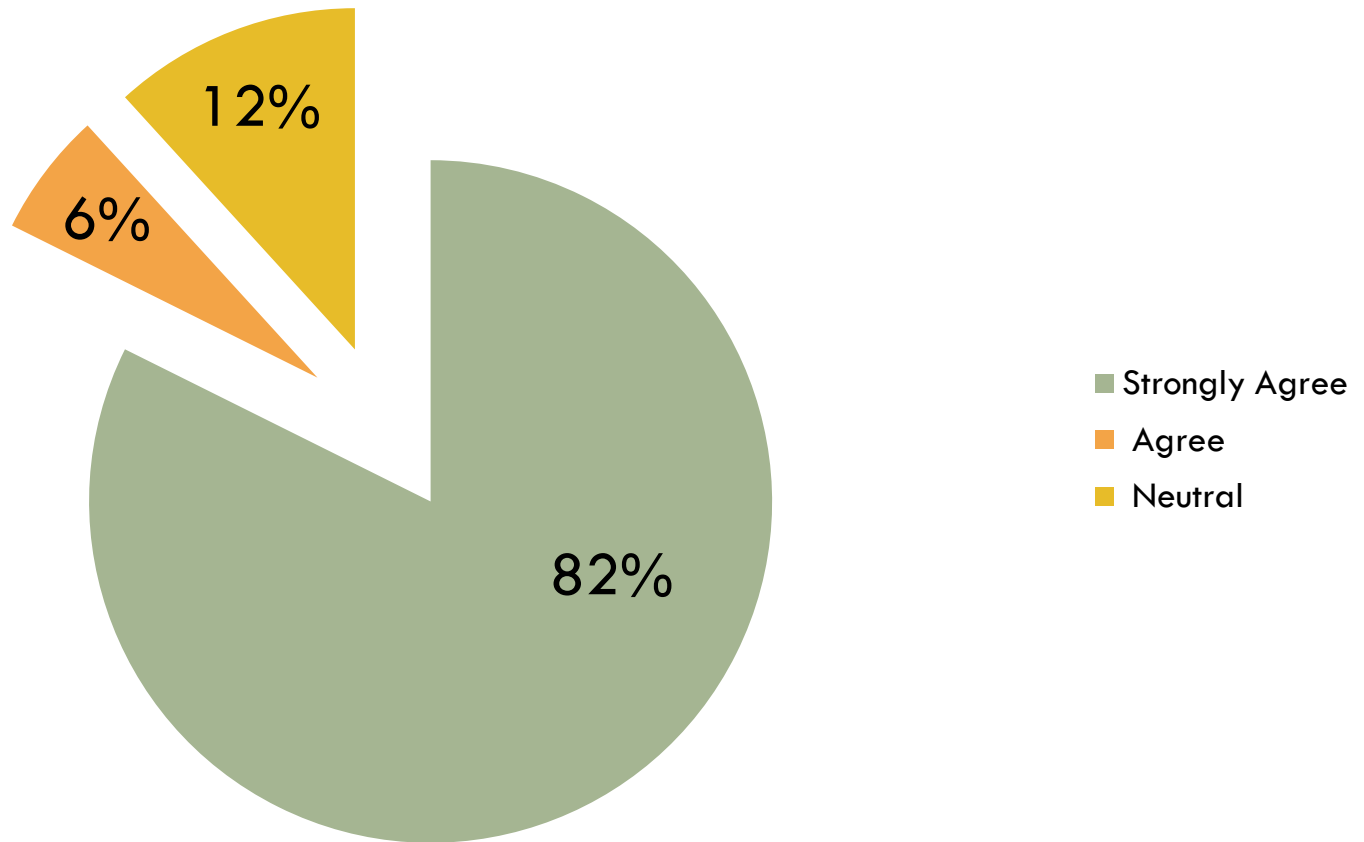
Send form

Participant demographics

- 17 participants completed the intro and exit surveys
- 53% Female, 47% Male
- Aged 24-54
- Highest level of education skewed toward undergraduate degree 50%
- 65% pay their own electric, 35% have it included in rent

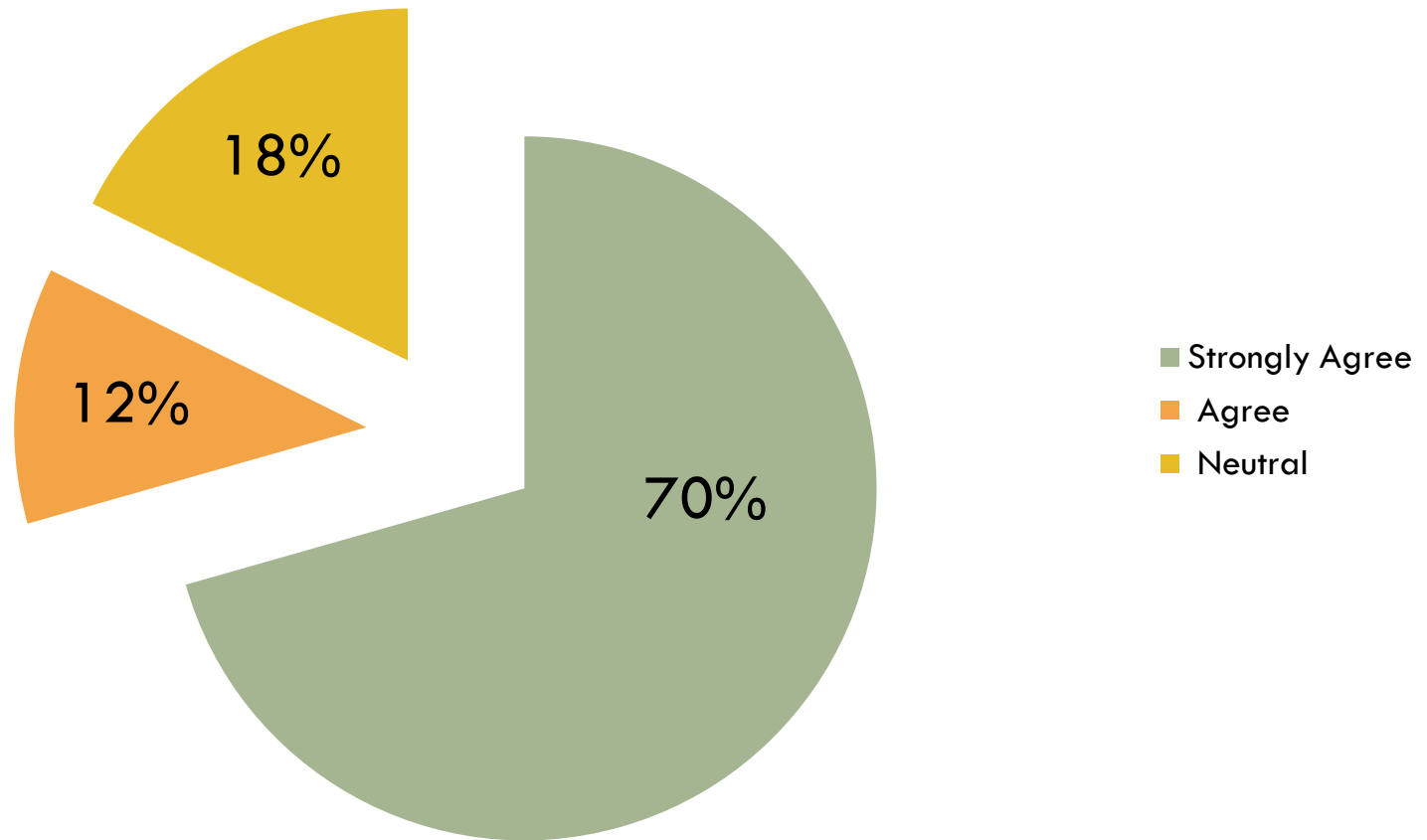


Attitudes: Energy Efficiency Importance



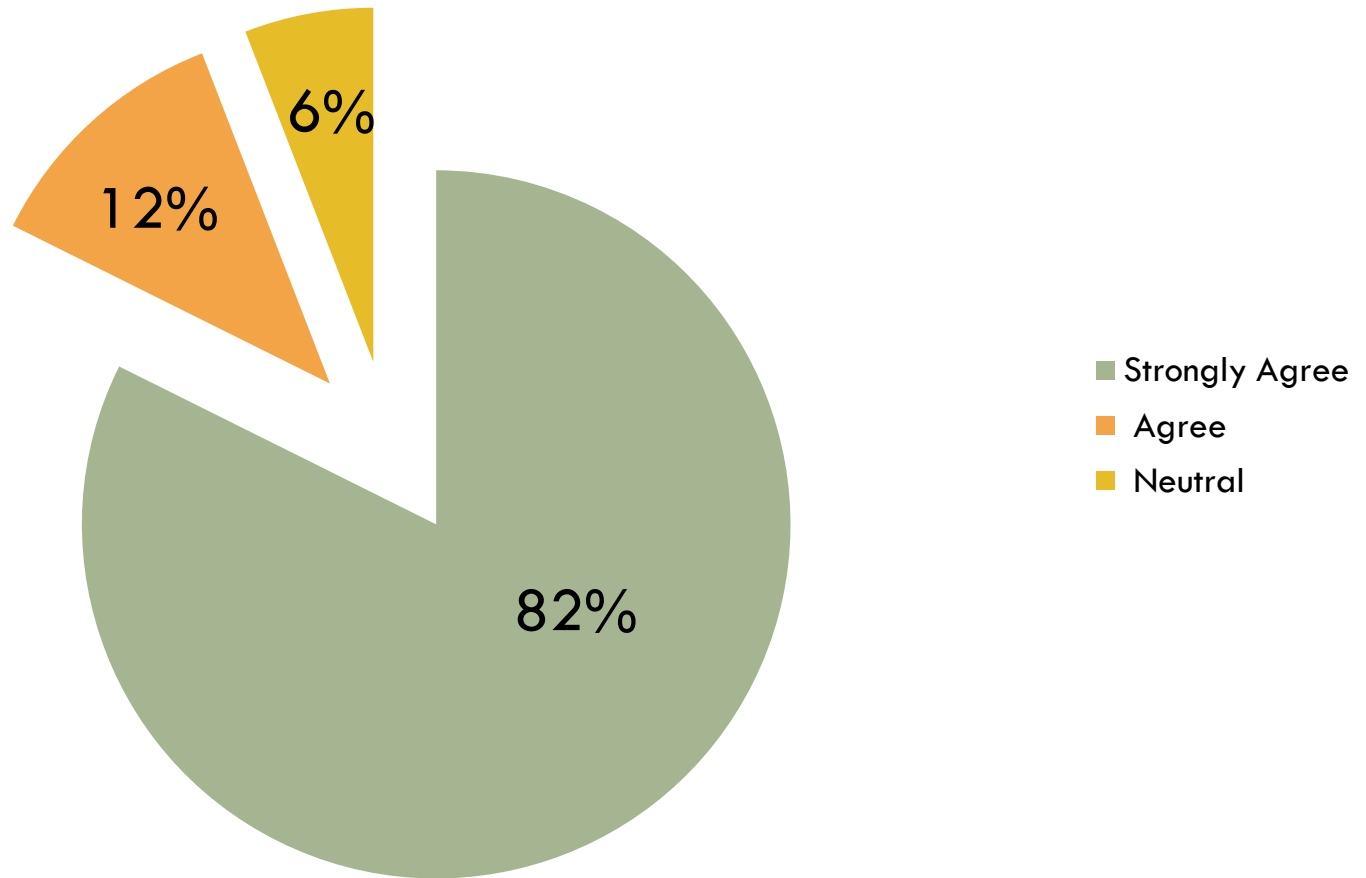
“I feel energy efficiency is important.”

Attitudes: Environmental Importance



“I am concerned about the environment.”

Attitudes: Financial Importance



“I'd like to save money on my electricity bill.”

The exit survey

- Re-enter of matching alias
- 4 self assessed, parallel, behavioral questions
- 3 questions assessing potential behavioral change
- 6 questions about impressions of the module

The screenshot shows a web-based survey form titled "RREE Postsurvey". The interface includes a menu bar with options like File, Edit, View, Insert, Responses (18), Tools, and Help. Below the menu, there are buttons for "Theme...", "View responses", "Accepting responses", and "View live form". The main content area is titled "Post-survey" and contains the following text:

for Realizing Rental Energy Efficiency

Please enter the alias entered in your intro-survey.*

After this module, do you feel you can select solutions to increase the energy efficiency of lighting of your residence?*

1 2 3 4 5

Strongly Disagree Strongly Agree

After this module, do you feel you could select solutions to increase the energy efficiency of your water heating?*

1 2 3 4 5

Strongly Disagree Strongly Agree

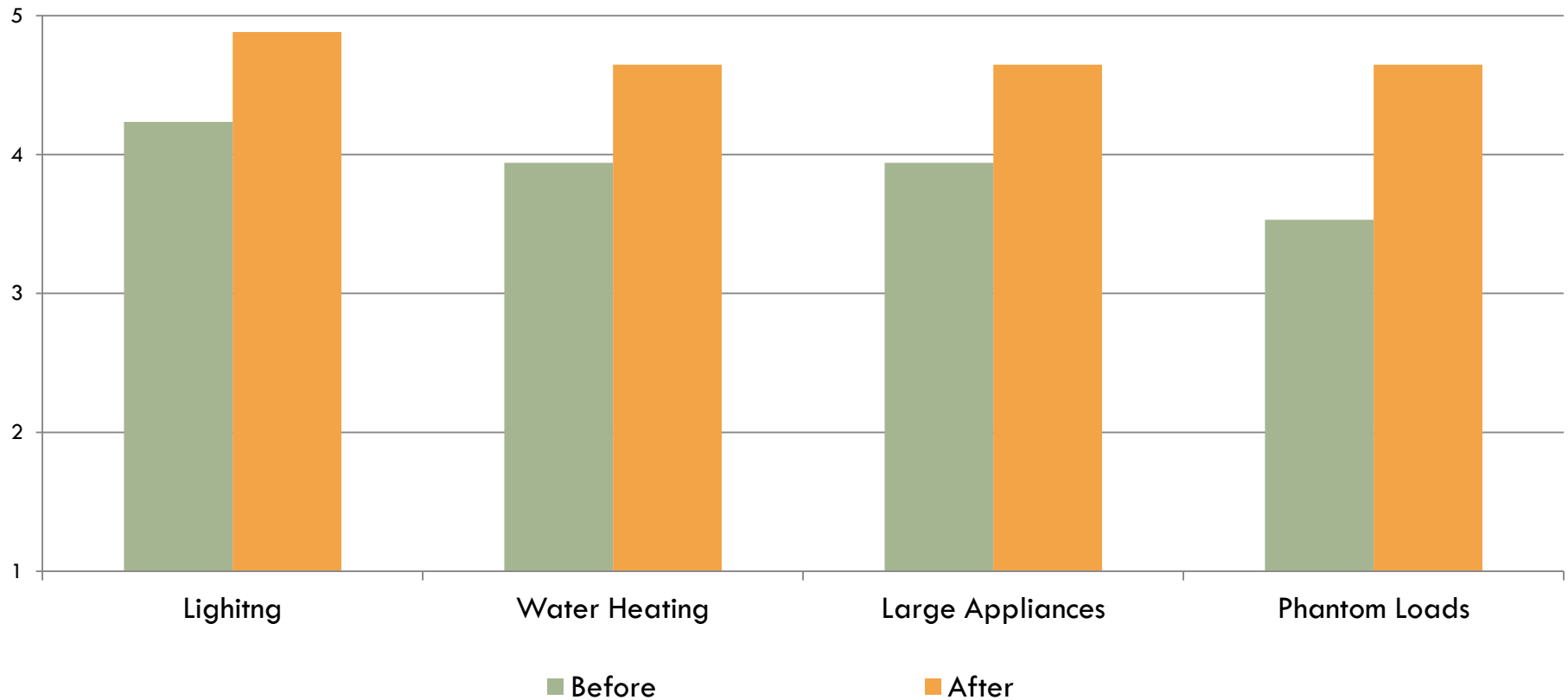
After this module, do you feel you could select solutions to increase the energy efficiency of your large appliances?*

1 2 3 4 5

Strongly Disagree Strongly Agree

The form is displayed on a page labeled "Page 1 of 1". A "Send form" button is visible in the top right corner.

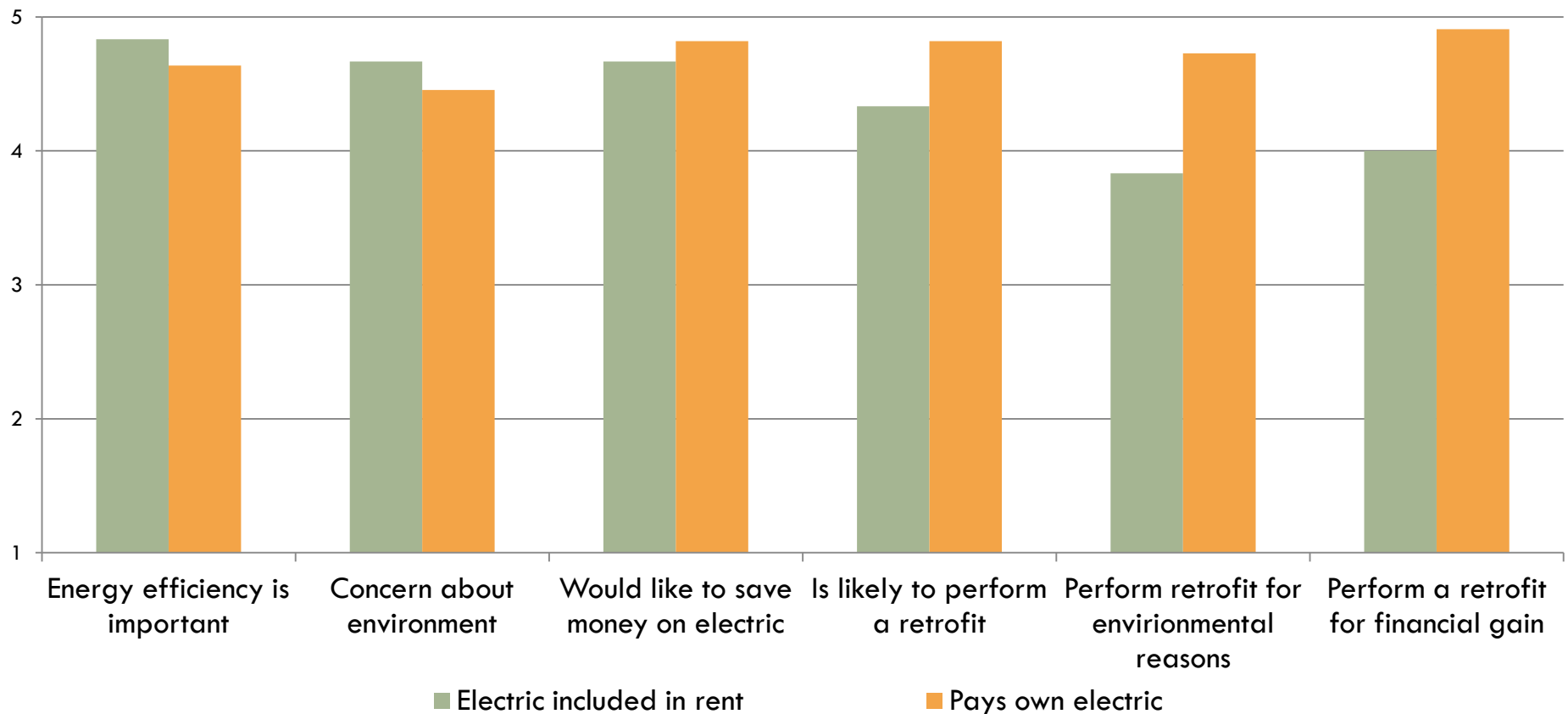
Module effectiveness



Pre and post self assessment responses compared.

Comparative results & implications

Demographic information to attitude and potential behavioral change



Implications and discussion

- Accountability: electric included in rent or not
- Motivation for change: economic and environmental
- Did behavioral change result?



Limitations

- Age group representation
- Educational level representation
- Motivational factors
- Scope





“The future is literally in our hands to mold as we like. But we cannot wait until tomorrow. Tomorrow is now.” – *Eleanor Roosevelt*